

REMARKS

Claims 1-54 were pending. Claims 26-32 and 47-52 are hereby withdrawn from consideration but are not canceled since the election of claims was with traverse. Claims 1, 2, 8, 10-17, 19, 20, 24, 25, 33, 35-44, 53 and 54 have been amended. The currently pending claims are Claims 1-25, 33-46, and 53-54. Claims 4-9 and 36-38 were objected to. The remaining claims are rejected.

Rejections

It was pointed out that Claims 1, 17, 33 and 41 did not recite steps a)-d). These claims are accordingly amended. The claims are also amended to eliminate multiple dependent claims. The other claim amendments here are to improve form and clarity, but not to overcome any rejection.

Other Claim Rejections

Claims 1-3, 10-17, 19-25, 33-35, 39-46, and 53-54 stand rejected under 35 U.S.C. §102(b) as anticipated by Slater.

Claim 18 stands rejected under 35 U.S.C. §103(a) as unpatentable over Slater in view of Haviland.

The Examiner indicated that Claims 4-9 and 36-38 were objected to as being dependent upon a rejected base claim, but indicated as being allowable if rewritten in independent form, including all limitations of the base claim and any intervening claims. However, Applicant has not done so since it is believed that all claims are allowable, including the independent claims. However, Applicant expresses appreciation for the Examiner indicating such allowability.

Traversal

All the rejections are traversed on the ground that Slater does not anticipate any of the independent claims.

Present Invention

Each present independent claim is directed to a method or apparatus for controlling an attitude of the vehicle that involves sensing or taking a measurement in a first spectral band, and also sensing or taking a measurement in a second different spectral band. Thus the vehicle attitude is determined using the results from two different bands of radiation.

Further these two measurements are combined together in order to control the attitude. For instance FIG. 4 shows an embodiment of the present invention with an aircraft 10 having UV sensor 60 and green wavelength sensor 61. Similar on the other side of the aircraft 10 are UV sensor 70 and green wavelength sensor 71. As pointed out at page 11 of the published specification beginning line 6, for both sensors 60 and 61, the sun will be the brightest object in their fields of view. However UV sensor 60 is highly sensitive to the contrast between the ground and sky 80 whilst the image 81 viewed by green sensor 61 is essentially insensitive to this difference. An appropriate weighted proportion (factor K) 62 of the green sensor 61 output is subtracted 63 from the UV sensor 60 output, then the effects of the sun can be substantially reduced resulting in image 82 for the left side. A similar process is effective for the right side of the aircraft resulting in image 92.

Hence there are two types of sensors, one sensing the UV and the other sensing the green spectrum and further the measurements of each of these spectrums are combined together.

Slater

There is nothing like this in Slater, which is a much simpler system. It is respectfully submitted that Slater in no way discloses the subject matter to which the present claims are directed

to. The Examiner cited Slater column 1, beginning line 64-column 2, line 42, as showing the first and second sensors, each sensing a different frequency band of radiation. There is no such structure however in Slater. The Examiner has either purposely or accidentally conflated two separate embodiments of Slater. These two embodiments are first the embodiment of FIG. 1 as explained at Slater column 2, beginning line 65 "Fig. 1 is a diagrammatic view of an aircraft in flight equipped with one form of apparatus according to the invention, to illustrate the principle of operation; this form making use of a microwave scanner,". (Emphasis added.)

The second embodiment is explained at Slater column 3, beginning line 1 "Fig. 3 shows diagrams applying to a second form of the invention, in which the actual horizon is scanned for infra-red energy,". (Emphasis added.)

This is repeated at Slater column 3, beginning line 23, referring to Figs. 1 and 2 as describing the electromagnetic energy scanner embodiment, that is essentially a radar-type approach apparently.

The second embodiment using the naturally present infra-red is explained beginning at column 6, line 51 "It is convenient in some cases to employ radiant energy of natural origin for vertical or level reference. Infra-red radiation from the earth, water and sky in general exhibits a discontinuity at the horizon. According to the invention, this discontinuity can be detected, by suitable scanning devices..."

Continuing at column 7, line 17 "Fig. 4 shows a form of apparatus making use of infra-red radiation."

Hence there are two separate versions here. In no case are they combined in one aircraft or are the infra-red and electromagnetic energy as detected combined in any way. Hence in each case, and that is in each embodiment, Slater only measures a sole frequency band to determine his attitude control signal. At column 2, line 21, Slater describes the use of the radiant energy embodiment generated on the aircraft itself, which is the radar version, while his second embodiment uses natural radiant infra-red energy. Clearly there are two different embodiments of

the Slater invention being described. Neither of these is an integrated attitude control system using measurements in two spectral bands.

Further in accordance with the invention, and unlike Slater, the two resulting data sets (e.g., UV and green) are combined or processed with respect to each other. The Examiner referred to Slater column 5, lines 43-67, as meeting this aspect. However there is no place in this portion of Slater that describes this subject matter. Instead this passage of Slater only relates to operation of the gyro of the Slater system.

Claims Distinguish Over The References

Therefore representative Claim 1 distinguishes over Slater first because it calls for in the preamble “each region being viewed by a respective first sensor for sensing a first frequency band of electromagnetic radiation and respective second sensor for sensing a second frequency band of electromagnetic radiation”. Clearly this is not shown in Slater as pointed out above. Second, Claim 1 additionally distinguishes over Slater because Claim 1 calls for in step d) “combining the result of said modifying step with said first data set to form a third data set for said first region;”. This results in using the modified second data set combined with the first data set to control the attitude. Again, no such combining aspect is shown or suggested in Slater. Even combining Haviland with Slater fails to remedy the deficiencies of Slater. Hence Claim 1 distinguishes thereover.

The remaining independent claims are directed to similar subject matter as Claim 1 and allowable for at least the same two reasons, as are all dependent claims in addition to those indicated as allowable by the Examiner.

Slater Does Not Make Claims Obvious

Further, it is respectfully submitted that Slater does not render the present approach obvious. While the Examiner made no such rejection, it is pointed out that if he were to do so it would not be appropriate. There is no motivation or reason in Slater or elsewhere to combine the results of his infra-red and radar approaches. As Slater describes them, each of them independently

is operable to perform his purpose stated in his first paragraph column 1 which is "to establish a level reference without reliance on gravity." The infra-red approach and the radar approach are indicated in Slater as being separate and equally useful, that is interchangeable. However there would be no reason to combine the results of both.

Instead the present inventors have determined that using two separate forms of sensed radiation together provides a superior approach for controlling attitude. Hence an obviousness rejection citing Slater would not be well founded.

CONCLUSION

In view of the above, all presently pending claims in this application are believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejections of the claims and to pass this application to issue. If it is determined that a telephone interview would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event that the U.S. Patent and Trademark Office determines that an extension and/or other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing **Attorney Docket No. 529172000800**.

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